

**Features**

- Halogen Free. "Green" Device (Note 1)
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

**Maximum Ratings @ 25°C Unless Otherwise Specified**

- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 250°C/W Junction to Ambient

Parameter	Symbol	Rating	Unit
Collector-Base Voltage	$V_{CBO}$	100	V
Collector-Emitter Voltage	$V_{CEO}$	80	V
Emitter-Base Voltage	$V_{EBO}$	5	V
Collector Current	DC	1	A
	Pulse <sup>(2)</sup>	2	A
Power Dissipation <sup>(3)</sup>	DC	0.5	W
	Pulse <sup>(2)</sup>	2	W

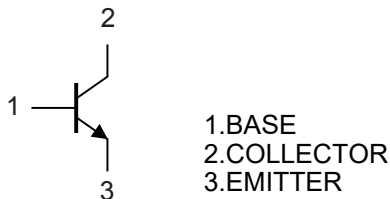
Note: 1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

2. Pulse Width=20ms, Duty Cycle=1/2.

3. Mounted on a 40x40x0.7mm Ceramic Board.

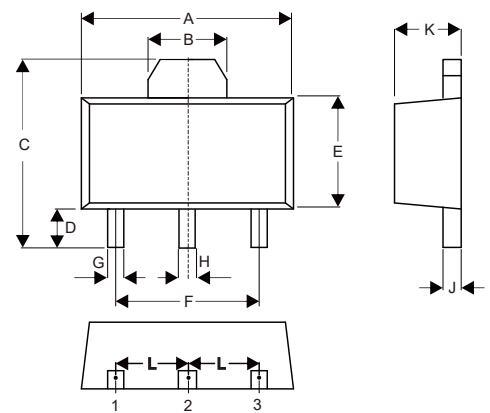
**Marking: DF**

**Internal Structure**



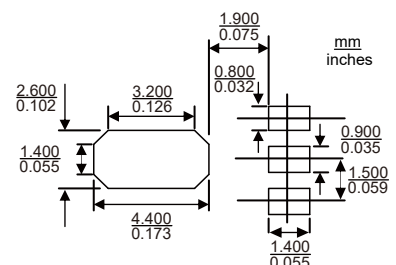
**NPN Silicon  
Power Transistors**

**SOT-89**



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.169	0.185	4.30	4.70	
B	0.061		1.55		TYP.
C	0.154	0.171	3.91	4.35	
D	0.031	0.047	0.80	1.20	
E	0.089	0.104	2.25	2.65	
F	0.118		3.00		TYP.
G	0.013	0.020	0.33	0.52	
H	0.015	0.021	0.38	0.53	
J	0.014	0.017	0.35	0.44	
K	0.055	0.063	1.40	1.60	
L	0.059		1.50		TYP.

**Suggested Solder Pad Layout**



**Electrical Characteristics @ T<sub>A</sub>=25°C Unless Otherwise Specified**

Parameter	Symbol	Min	Typ	Max	Units	Conditions
Collector-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	100			V	I <sub>C</sub> =50μA, I <sub>E</sub> =0
Collector-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	80			V	I <sub>C</sub> =1mA, I <sub>B</sub> =0
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	5			V	I <sub>E</sub> =50μA, I <sub>C</sub> =0
Collector Cutoff Current	I <sub>CBO</sub>			1	μA	V <sub>CB</sub> =80V, I <sub>E</sub> =0
Emitter Cutoff Current	I <sub>EBO</sub>			1	μA	V <sub>EB</sub> =4V, I <sub>C</sub> =0
DC Current Gain	h <sub>FE</sub>	82		390		V <sub>CE</sub> =3V, I <sub>C</sub> =0.5A
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>		0.15	0.4	V	I <sub>C</sub> =500mA, I <sub>B</sub> =20mA
Transition Frequency	f <sub>T</sub>		100		MHz	V <sub>CE</sub> =10V, I <sub>C</sub> =50mA, f=100MHz
Output Capacitance	C <sub>ob</sub>		20		pF	V <sub>CB</sub> =10V, I <sub>E</sub> =0, f=1MHz

**Classification of h<sub>FE</sub>**

Rank	P	Q	R
Range	82-180	120-270	180-390

## Curve Characteristics

Fig. 1 - Static Characteristics

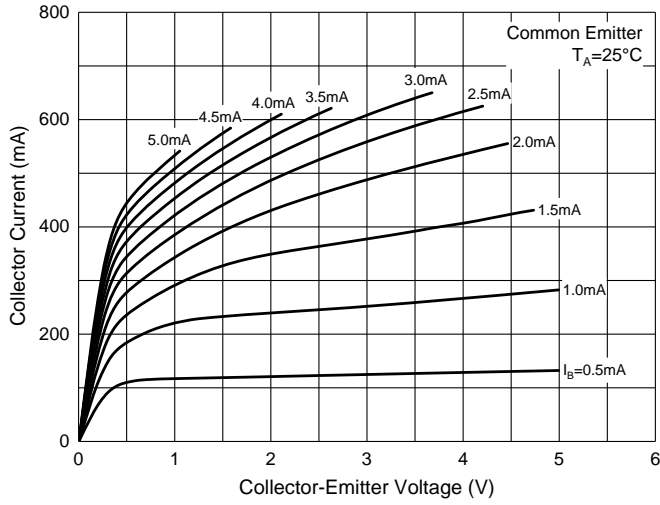


Fig. 2 - DC Current Gain Characteristics

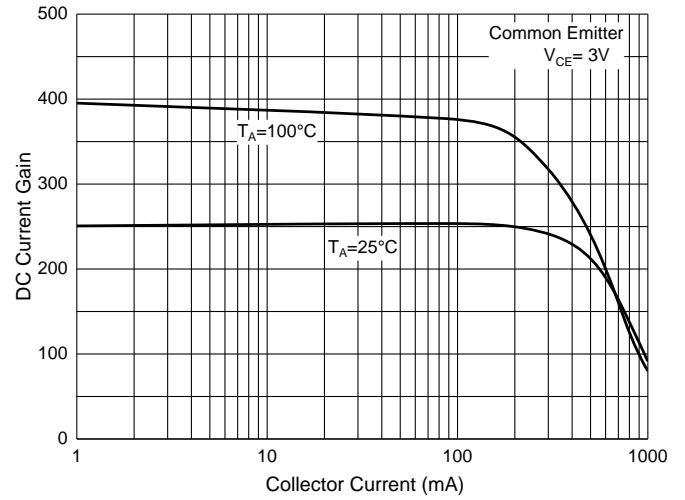


Fig. 3 - Base-Emitter Saturation Voltage Characteristics

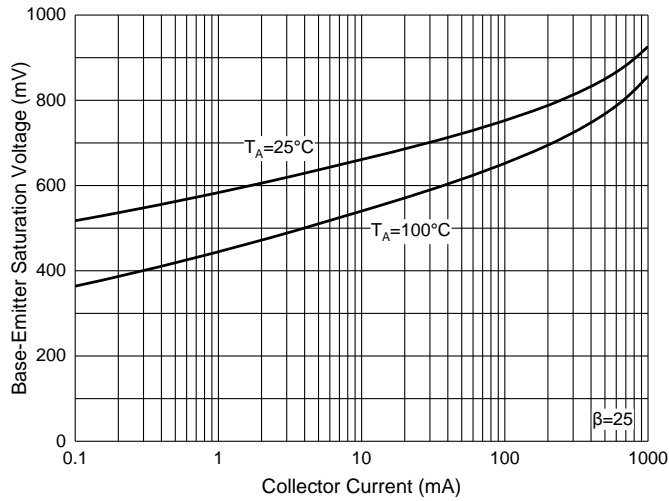


Fig. 4 - Collector-Emitter Saturation Voltage Characteristics

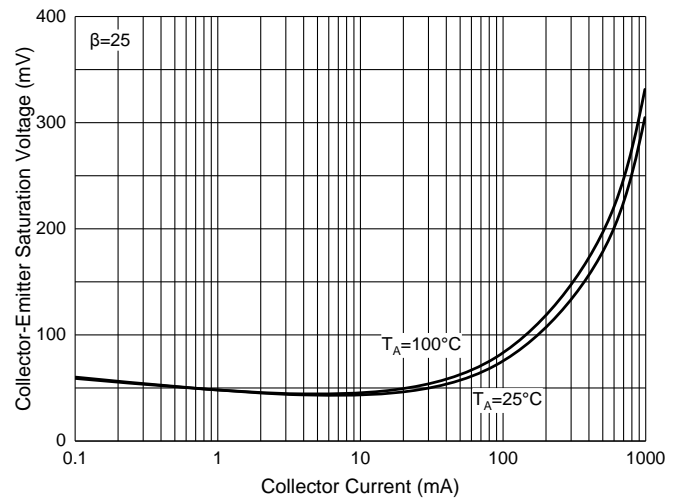


Fig. 5 - Collector Power Derating Curve

